MEASURING COMPLEX PROBLEM SOLVING ACROSS DIFFERENT CLASS LEVELS: ASSESSMENT, INVARIANCE AND CONSTRUCT VALIDITY

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Complex Problem Solving (CPS) is seen as a cross-curricular competency, which has recently attracted interest in large-scale assessments. In the PISA 2012 cycle, CPS will be assessed using minimally complex computer simulations based on the MicroDYN approach. In this talk, we present empirical results on MicroDYN, a computer-based test containing multiple items aimed to measure two main complex problem solving processes - knowledge acquisition and knowledge application. More specifically, we (a) test a measurement model composed of the two aforementioned processes, we (b) evaluate whether measurement invariance holds across different grade levels of Hungarian high school students in order to compare latent means between grade levels and (c) investigate relations between CPS, reasoning, grade point average (GPA), and parental education. Analyses are based on N=855 Hungarian high school students in grades 5 to 11. Using structural equation models, results show that (a) a 2-dimensional model with the facets knowledge acquisition and knowledge application fit the data best. Furthermore, (b) CPS is strongly factorial invariant and thus, mean differences between grades can be interpreted meaningfully. Latent means in both facets increase at higher grades, disregarding a considerable drop in CPS performance in grade 9. Finally, (c) results based on path analyses indicate that knowledge acquisition incrementally predicts variance in parental education and – to a lesser extent – in GPA even beyond reasoning. Results of this study provide important implications on how to use CPS in an educational and an assessment context.